

We claim:

1. A radio frequency direction finding antenna system comprising:

an antenna and reflector assembly comprising:

5 a reflector comprising a cylinder, said reflector having a longitudinal axis, said reflector establishing a beam plane substantially perpendicular to the longitudinal axis;

10 a first array of feed horns comprising a plurality of feed horns arranged in an arc around the cylinder, directed inwardly toward the cylinder, said array disposed in proximity to the beam plane, said feed horns being operable to receive radio frequency energy reflected from the cylinder within a first predetermined

15 frequency range.

2. A radio frequency direction finding antenna system of claim 1 further comprising:

20 an antenna array comprising a plurality of log periodic antennae arranged in an arc, said arc being substantially coaxial with the reflector, said antenna array being located in proximity to the antenna and reflector assembly, said log periodic antennae being operable to receive radio frequency energy incident thereon within a second predetermined frequency range.

25 3. A radio frequency direction finding antenna system of claim 2 further comprising:

an antenna array comprising a plurality of feed horns arranged in an arc, said arc being substantially coaxial with the reflector, said antenna array being located in proximity to the antenna and reflector assembly, 'said  
5 feed horns being operable to receive radio frequency energy incident thereon within a third predetermined frequency range.

4. A radio frequency direction finding antenna system of claim 3 wherein:

10 the first predetermined frequency range is about 6 to 18 Ghz;

the second predetermined frequency range is about 0.5 to 6 Ghz; and

15 the third predetermined frequency range is about 18 to 40 GHz.

5. The radio frequency direction finding antenna system of claim 1 wherein the reflector is a semi-cylinder.

6. The radio frequency direction finding antenna system of claim 1 wherein the reflector is a full cylinder which is flared  
20 at least one end.

7. The radio frequency direction finding antenna system of claim 1 wherein the reflector is a semi-cylinder which is flared at least one end.

8. The radio frequency direction finding antenna system of  
25 claim 1 wherein an outer surface of the cylindrical section is defined by a surface of revolution of a parabolic section about the longitudinal axis.

9. The radio frequency direction finding antenna system of claim 1 wherein the cylindrical section is a full cylinder which is flared each end thereof, and the first array is a circular array disposed coaxially with the cylinder.

5 10. The radio frequency direction finding antenna system of claim 1 wherein the cylindrical section is a semi-cylinder which is flared at each end thereof, and the first array is a semi-circular array disposed coaxially with the semi-cylinder.

11. A radio frequency direction finding antenna system  
10 comprising:

an antenna and reflector assembly comprising:

15 a reflector comprising a flared cylinder, said reflector having a longitudinal axis, said reflector establishing a beam plane substantially perpendicular to the longitudinal axis;

20 a first array of feed horns comprising a plurality of feed horns arranged in an arc around the cylinder, directed inwardly toward the flared cylinder, said array disposed in proximity to the beam plane, said feed horns being operable to receive radio frequency energy reflected from the flared cylinder within a first predetermined frequency range.

12. A radio frequency direction finding antenna system of claim 11 further comprising:

25 an antenna array comprising a plurality of log periodic antennae arranged in an arc, said arc being substantially coaxial with the reflector, said antenna array being located in proximity to the antenna and reflector

assembly, said log periodic antennae being operable to receive radio frequency energy incident thereon within a second predetermined frequency range.

13. A radio frequency direction finding antenna system of claim

5 12 further comprising:

an antenna array comprising a plurality of feed horns arranged in an arc, said arc being substantially coaxial with the reflector, said antenna array being located in proximity to the antenna and reflector assembly, said  
10 feed horns being operable to receive radio frequency energy incident thereon within a third predetermined frequency range.

14. A radio frequency direction finding antenna system of claim  
13 wherein:

15 the first predetermined frequency range is about 6 to 18  
Ghz;

the second predetermined frequency range is about 0.5 to 6  
Ghz; and

20 the third predetermined frequency range is about 18 to 40  
GHz.

15. The radio frequency direction finding antenna system of claim 11 wherein the reflector is a semi-cylinder.

16. The radio frequency direction finding antenna system of claim 11 wherein the flared cylinder is a full cylinder.

25 17. The radio frequency direction finding antenna system of claim 11 wherein an outer surface of the flared cylinder is

defined by a surface of revolution of a parabolic section about the longitudinal axis.

18. The radio frequency direction finding antenna system of claim 11 wherein the flared cylinder is a full cylinder which is flared at each end thereof, and the first array is a circular array disposed coaxially with the cylinder.

19. The radio frequency direction finding antenna system of claim 11 wherein the flared cylinder is a semi-cylinder which is flared at each end thereof, and the first array is a semi-circular array disposed coaxially with the semi-cylinder.

20. The radio frequency direction finding antenna system of claim 11 wherein an outer surface of the flared cylinder is defined by a surface of revolution of an imperfect parabolic section about the longitudinal axis.

21. A radio frequency direction finding antenna system comprising:

an antenna and reflector assembly comprising:

a reflector comprising a cylindrical section, said reflector having a longitudinal axis, said reflector establishing a beam plane substantially perpendicular to the longitudinal axis;

a first array of feed horns comprising a plurality of feed horns arranged in an arc around the reflector, directed inwardly toward the reflector, said array disposed in proximity to the beam plane, said feed horns being operable to receive radio frequency energy reflected from the reflector within a first predetermined frequency range.

22. A radio frequency direction finding antenna system of claim 21 further comprising:

an antenna array comprising a plurality of log periodic antennae arranged in an arc, said arc being substantially coaxial with longitudinal axis of the reflector, said antenna array being located in proximity to the antenna and reflector assembly, said log periodic antennae being operable to receive radio frequency energy incident thereon within a second predetermined frequency range.

23. A radio frequency direction finding antenna system of claim 22 further comprising:

an antenna array comprising a plurality of feed horns arranged in an arc, said arc being substantially coaxial with the longitudinal axis of the reflector, said antenna array being located in proximity to the antenna and reflector assembly, said feed horns being operable to receive radio frequency energy incident thereon within a third predetermined frequency range.

24. A radio frequency direction finding antenna system of claim 23 wherein:

the first predetermined frequency range is about 6 to 18 Ghz;

the second predetermined frequency range is about 0.5 to 6 Ghz; and

the third predetermined frequency range is about 18 to 40 GHz.

25. The radio frequency direction finding antenna system of claim 21 wherein the cylindrical section is a semi-cylinder.

26. The radio frequency direction finding antenna system of claim 21 wherein the reflector is a full cylinder which is flared at least one end.

5 27. The radio frequency direction finding antenna system of claim 21 wherein the cylindrical section is a semi-cylinder which is flared at least one end.

10 28. The radio frequency direction finding antenna system of claim 21 wherein an outer surface of the cylindrical section is defined by a surface of revolution of a parabolic section about the longitudinal axis.

29. The radio frequency direction finding antenna system of claim 21 wherein the cylindrical section is a full cylinder which is flared each end thereof, and the first array is a circular array disposed coaxially with the cylinder.

15 30. The radio frequency direction finding antenna system of claim 21 wherein the cylindrical section is a semi-cylinder which is flared at each end thereof, and the first array is a semi-circular array disposed coaxially with the semi-cylinder.